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September 7, 2007

Via Hand Delivery

Ms. Ann Cole
Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Docket No. 070298-EI
Review of 2007 Electric Infrastructure Storm Hardening Plan Filed Pursuant To Rule 25-6.0342, Florida Administrative Code, Submitted by Progress Energy Florida

Dear Ms. Cole:

Enclosed for filing in the above matter are an original and 15 copies of the Direct Testimony of Michael T. Harrelson on behalf of Florida Cable Telecommunications Association, Inc. Service has been made as indicated on the Certificate of Service. If there are any questions regarding this filing, please contact me at 202-973-4281.

Sincerely,

Maria T. Browne
John D. Seiver

Enclosures

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CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing *Direct Testimony of Michael T. Harrelson* on behalf of *Florida Cable Television Association, Inc.* was furnished by regular U.S. mail, on this the 7th day of September, 2007 to the following:

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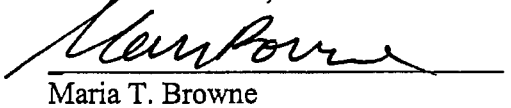

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

Review of 2007 Electric Infrastructure Storm Hardening Plan Filed pursuant to Rule 25-6.0342, F.A.C., Submitted by Progress Energy Florida, Inc.	**Docket No. 070298-EI**

DIRECT TESTIMONY OF MICHAEL T. HARRELSON ON BEHALF OF FLORIDA CABLE TELECOMMUNICATIONS ASSOCIATION, INC.

SEPTEMBER 7, 2007

Introductory Issues

Q. Please state your name, title, and business address.

A. My name is Michael T. Harrelson. I am a registered professional engineer (Electrical), and an engineering consultant.

Q. On whose behalf are you filing this testimony?

A. I am appearing on behalf of the Florida Cable Telecommunications Association, Inc. ("FCTA"), an intervener in this proceeding.

Q. Would you please summarize your education, experience and qualifications?

A. Certainly. I have Bachelor of Science in Industrial Engineering from Georgia Tech where I was a co-op student while working for Georgia Power Company. I started working at Georgia Power in electric distribution in their co-op program where I also began work toward my B.S. when I was 18, in 1963. I was at Georgia Power in various districts and in various capacities of electric distribution, engineering, construction and maintenance until 1992. In 1992, I began a career as an Engineering Consultant. I am a registered professional engineer in Georgia and Florida. A more detailed rendering of my work history is included in my CV which is attached as Harrelson Exhibit 1 ("MTH-1").

Q. Have you had any experience in working with joint use of electric distribution poles by communications companies?

A. Yes. I have had extensive experience in this area.

Q. Do you have knowledge of the National Electrical Safety Code ("NESC")?

A. Yes I do. The NESC is the national safety standard for electric supply stations and electric supply and communication lines. The current edition is ANSI C2-2007, ISBN No. 0-7381-4893-8. The purpose of the NESC is the practical safeguarding of persons during the installation, operation, or maintenance of electric supply and communication

lines and associated equipment. This code is not intended as a design specification or as a construction manual. The NESC rules contain the basic provisions that are considered necessary for the safety of employees and the public under the specified conditions. If the responsible party wishes to exceed these rules, he may do so for his own purposes, but need not do so for safety purposes. NESC compliance is mandatory in Florida for electric power and communications companies.

Q. Do you consider yourself knowledgeable in these areas?

A. Yes. I consider myself to be an expert in the NESC and its application to construction, installation, maintenance, inspection, and audit of electric and communications facilities on poles.

Q. Why is that?

A. I worked for Georgia Power Company for a total of 27 years, including during the late 1960s and early 1970s when the first cable television systems were built in Georgia, and elsewhere around the country. Because I worked for Georgia Power until 1992, I also witnessed the upgrade and rebuild of improved generations of cable television systems and saw how both cable companies and pole owners, including power companies, work together to complete these system upgrades and rebuilds. Since retiring from Georgia Power I have worked as a consulting engineer and an expert witness to electric companies, cable companies and others.

Q. Have you ever been qualified as an expert witness?

A. Yes.

Q. In what subjects or fields have you been so qualified?

A. I have been qualified as an expert in (1) the NESC requirements; (2) electric power distribution design, construction, engineering, operation, and maintenance procedures; (3) joint use of utility poles by power and communications companies; (4) OSHA electric

power and communications safety regulation; and (5) the National Electric Code, which applies to electric power utilization systems.

Q. On how many occasions have you given testimony as an expert witness in these areas?

A. I have testified either in deposition or at trial approximately 41 times in the past 18 years. I testified in a pole attachment dispute before the Utah Public Service Commission in a matter closely related to some issues in this proceeding. That dispute involved attachment permitting procedures, engineering guidelines for attachments, and interpretations of the NESC. In addition, in a similar dispute in Arkansas, I submitted written testimony to the FCC and participated in a mediation session before the Federal Communications Commission ("FCC"). I have also submitted written comments to the Louisiana Public Service Commission in a proceeding to reconsider regulations regarding pole attachment procedures in the state. Moreover, in the spring of last year I gave deposition testimony, submitted direct testimony and testified live on cross examination before the Chief Administrative Law Judge ("ALJ") at the FCC on behalf of the FCTA and four of its member operators. The issue in that proceeding was whether Gulf Power was entitled to charge pole attachment rates in excess of rates produced using the FCC formula for cable operator attachments based on, among other things, Gulf Power's claim that its poles were "full" and that no capacity for further attachments existed. I testified that safe and customary engineering practices, based on my years of experience and the NESC, demonstrated that Gulf Power's poles had capacity and the Chief ALJ agreed with my analysis. The matter is now on appeal. I also participated in the Florida Commission's ("FPSC" or the "Commission") rulemaking proceeding in Dockets No. 060172-EU and 060173-EU, through which Rule 25-6.0342, Florida Administrative Code ("F.A.C."), was developed. Furthermore, I submitted Comments to this Commission in the Storm Preparedness proceeding, Docket No. 060198-EI.

Q. Do you have additional relevant experience?

A. Yes. I have participated in more than 100 pieces of litigation or accident investigations as a consultant.

Q. Are there other aspects of your training and background that may be relevant to your testimony?

A. Yes. In addition to working in this industry for quite a number of years, I regularly attend conferences on joint use, conduct training sessions and conduct pole-line inspections for pole owners like electric utilities, not unlike the inspections that are at least in part at issue in this proceeding. Through these activities I am very familiar not only with standard industry practices as they relate to outside aerial utility plant and joint use, but am also very familiar with the trends and "state-of-the-art" of utility and communications company practices in this area.

Q. Do you have experience with hurricanes in South Florida?

A. Yes. I worked in South Florida for an electric cooperative in restoration of service after Hurricanes Jean, Francis, Charlie and Wilma. I personally observed the destruction of trees and buildings and their impact on distribution lines, as well as the poles leaning in softened soil, and cascading failures caused by one pole being broken that resulted in several more poles being broken. I saw places where several poles broke and fell in one direction but several adjacent poles in the same line fell in the opposite direction indicating tornado type winds in localized areas. The greatest numbers of power outages were caused by tree limbs and broken wires, not broken poles.

Q. Has your work been limited to field work?

A. No. I have consulted as a Registered Professional Engineer in joint use contract interpretation and application for 15 years. This includes inspecting joint use facilities, training field engineers and line workers in the NESC, joint use contracts and safe-work

rules, negotiating specific separation, clearance and arrangement requirements (which are additional requirements sometimes imposed by power companies). I have also negotiated procedures, techniques and schedules to complete safety audits, make-ready engineering, make-ready construction and post inspection for joint use projects. I have prepared and conducted numerous workshops or seminars for national joint use conferences and personally conducted several NESC code compliance audits, as well as prepared the necessary make-ready engineering for the power companies and communications companies involved that was necessary to correct violations uncovered in those audits.

Q. Anything else?

A. Yes. In the past I have been President of local utility coordinating committees in Brunswick and Milledgeville, Georgia and periodically attend national joint use conferences.

Q. Please describe your work as President of the local utility coordinating committees.

A. These are organizations that are established to foster better communication among the different industries and users that need to use poles and be in the right-of-way. We discuss, design and implement ways to accommodate safe, practical and timely access and use of the limited facilities that all these different companies need to use to provide their services.

Q. Is the purpose of these committees to facilitate joint use of poles?

A. Yes, in part. Other issues such as joint trenching, right-of-way restoration, tree-trimming and the like were also considered. But the principal motive for these particular organizations and ones like them is to provide a forum for inter-industry understanding and to find real-world solutions to real-world problems in the joint use area.

Q. Are you sponsoring exhibits in this case?

A. Yes. MTH-1 (my curriculum vitae and list of testimonies); MTH-2 (Affidavit of Dr. Lawrence M. Slavin Supporting Initial Comments of Verizon Florida Inc. Concerning Proposed Amendments to Rules 25-6.034, 25-6.064, 25-6.078, and 25-6.115, Dockets 060173-EU and 060172-EU (FPSC, filed Aug. 11, 2006) ("Slavin Affidavit")); and MTH-3 (Process to Engage Third Party Attachers).

Q. Could you please explain what your assignment from FCTA was in this proceeding?

A. Certainly. My assignment was to evaluate the Storm Hardening Plan (the "Plan") filed by Progress Energy Florida, Inc. ("PEF", "Progress" or the "Company") in this docket for the purpose of determining whether the Plan meets the overall objective of the Commission, as set forth in Rule 25-6.0342, F.A.C., of enhancing the reliability of electric transmission and distribution service in a prudent, practical and cost-effective manner. In my testimony, I will address the Company's decision to adhere to Grade C construction for its distribution facilities while adopting extreme wind loading standards for transmission facility projects, the deployment strategy the Company will follow to implement those standards, and whether the adopted standards and deployment strategy meet the Commission's overall objectives. I will also address the extent to which the standards and procedures for third party attachments included in the Plan meet or exceed the NESC to assure as far as reasonably practicable that third party attachments do not impair electric service reliability or overload the pole, and are constructed, maintained and operated in accordance with generally accepted engineering practices for the IOU's service territory. Lastly, I will address the extent to which the Company sought and attempted in good faith to accommodate input from attaching entities.

Q. How do the provisions of the Company's Plan impact the cable operators who are attached to the Company's poles?

A. Cable operators rely on telephone and increasingly power company (who own collectively approximately 80% of the poles statewide) pole infrastructure to distribute video, voice and broadband services to over five million residents throughout the state of Florida. Cable operators are in an intensely competitive industry (competing with satellite operators and telephone companies) and have a fervent interest in ensuring that poles stay up—and their facilities too—to minimize service interruptions, provide access to the Internet, phone service, cable service and important emergency and information services. FCTA and its members also are interested in ensuring that the State's utility poles are safe and reliable and that construction, maintenance and inspection costs are reasonable. Because of quality of service objectives and competitive pressures, cable operators must be sure there are no unreasonable delays in attaching or overlashing cables that would delay provisioning of service to customers, or unreasonable costs imposed that would jeopardize their ability to invest in new and innovative services. Cable operators pay rent based upon the fully allocated cost of the pole space occupied by the cable operator's attachment. Cable operators also directly reimburse utilities for the cost of making the pole ready for their attachments, and pay to make the pole compliant with the NESC when a cable operator is responsible for bringing the pole out of compliance. One of my most significant concerns is that cable operators could face additional delays in provisioning important services to their customers that are not related to pole safety and reliability due to the Company's Plan, as well as increased costs. I will address these and related issues below in reference to the Company's Plan and the relevant statutory and regulatory requirements.

Q. What is your understanding of what the Company's Plan must do to comply with Rule 25-6.0342, F.A.C.?

A. It is my understanding that under that provision the Company's Plan must meet the overall objective of enhancing the reliability of electric transmission and distribution service and reducing restoration costs and outage times in a prudent, practical, and cost-effective manner to the affected parties.

Q. Could you please give us details on what the Plan must include and do to meet those requirements?

A. Yes. First, the Plan must address the extent to which the Company complies with the NESC. Second, the Plan must address the extent to which it employs the extreme wind loading ("EWL") standards specified by Figure 250-2(d) of the 2007 edition of the NESC for new construction, major planned work, and critical infrastructure projects to achieve the objective of enhancing reliability and reducing restoration costs in a prudent, practical and cost effective manner. Third, the Plan must include a detailed description of its deployment strategy, including the facilities affected, the technical design specifications, construction standards, and construction methodologies employed, the communities and areas affected, the extent to which joint use facilities are affected, an estimate of the costs and benefits of the Plan generally, and an estimate of the costs and benefits of the Plan for third party attachers, and explain how the deployment strategy meets the desired objectives of enhancing reliability and reducing storm restoration costs and outage times in a prudent, practical and cost effective manner. Fourth, the Plan must demonstrate that the Company maintains standards and procedures for third party attachments that meet or exceed the NESC so as to assure as far as reasonably practicable that third party attachments do not impair electric service reliability or overload the pole, and are constructed, maintained and operated in accordance with generally accepted engineering practices for the investor-owned utility's (IOU) service territory, and do not conflict with Title 47, United States Code, Section 224, relating to FCC jurisdiction over pole

attachments. Lastly, the Company must show that, in developing its Plan, it sought input from, and attempted in good faith to accommodate concerns raised by, third party attachers such as cable operators.

Company Plan

Q. Have you read the Storm Hardening Plan and the Plan Supplement filed by the Company in the referenced docket?

A. Yes.

Q. Have you reviewed the Direct Testimony and Exhibits of the Company's witnesses, Jason Cutliffe and Mickey Gunter, dated August 24, 2007, filed in support of the Company's Plan?

A. Yes.

Q. Have you reviewed the answers to interrogatories and responses to document requests filed by the Company to date in this proceeding?

A. Yes.

Q. Should the Commission find that the Company's Plan meets the desired objectives of enhancing the reliability of overhead and underground electrical transmission and distribution facilities and reducing restoration costs and outage times in a prudent, practical and cost effective manner?

A. No.

Q. Why not?

A. First, the Company has not provided the level of detail for its deployment strategy required by Rule 25-6.0342(4), F.A.C. For example, with regard to projects identified for implementation in 2008 and 2009, the Plan lacks the level of detail necessary to enable the cable operators to determine the costs that they will incur as a result of those projects. However, the Process to Engage Third Party Attachers (MTH-3) that has been agreed to

by Progress sets forth a mutually satisfactory process for continuing the dialogue between utilities and third party attachers, including reasonable advance notice to, and a process for incorporating feedback from, third party attachers. This goes a long way toward alleviating my concerns about the level of required detail that currently is missing from Progress's Plan.

Furthermore, the Company's attachment standards and procedures should not be in the Plan for purposes of Commission approval. At a minimum, certain of the Attachment Standards and Procedures set forth in the Plan do not relate to storm hardening but instead concern rates, terms and conditions that are regulated by the FCC, and others are not *reasonably practicable* as required by Rule 25-6.0342(5), F.A.C. In addition, the Company has not fully satisfied its obligation to seek and attempt in good faith to accommodate concerns of third party attachers such as FCTA members.

Wind Loading Standard

Q. Does the Company's Plan address the extent to which, at a minimum, the Plan complies with the NESC, ANSI C2-2007, as required by Rule 25-6.0345, F.A.C.?

A. Yes. The Company's Plan addresses the extent to which it complies with the NESC to the extent required by Rule 25-6.0342, F.A.C. This Rule concerns strengthening poles to withstand extreme wind conditions. The relevant NESC rules are those that address loading and the effect of wind on the poles they are located in Sections 24 (Grades of Construction), 25 (Loadings for Grades B and C) and 26 (Strength Requirements). It is my understanding that other provisions of the NESC, including those related to clearances between electric and communications facilities, are not at issue in this proceeding. PEF does not address those requirements, but refers to them, and therefore, I am not expressing an opinion on those provisions except to point out which ones fall outside the scope of this proceeding and therefore should not be approved. With this understanding, yes, the

Company's Plan addresses the extent to which it complies with the NESC to the extent required by 25-6.0342(3)(a), F.A.C. *See, e.g.,* Plan at 4, and Progress Energy Florida's Responses to Staff's First Set of Interrogatories No. 2.

Q. Does the Company's Plan comply, at a minimum, with the NESC?

A. Yes. The NESC specifies required pole line strengths for distribution lines using grades of construction including Grades B, C and N. The required grade of construction depends upon the voltage of the circuits carried on the pole and what the circuits cross over. The NESC generally requires Grade C construction for "distribution" facilities less than 60 feet high. Grade B is required for certain crossings, including railroad tracks, limited-access highways, and navigable waterways requiring waterway crossing permits. In its Plan and Testimony, Progress indicates that it intends to maintain Grade C standard construction on a system wide basis, but will also conduct pilot projects for the purpose of testing Grade B and EWL construction under different field conditions as well as the Grade C standard. The Company's Plan appropriately applies Grade C construction in a manner consistent with the requirements of the NESC. Furthermore, Progress has already instituted a vegetation management program that will provide additional benefit to the storm hardening and restoration effort. As such, Progress's approach is not only consistent with the NESC, but represents a prudent, practical, and cost-effective approach.

Q. Does the Company's Plan address the extent to which it is adopting the extreme wind loading (EWL) standards specified by Figure 250-2(d) of the 2007 edition of the NESC?

A. Yes. Progress's plan explains at pages 9-15 the extent to which it adopts EWL standards for distribution facilities. It utilizes DCI's Asset Investment Strategy modeling to evaluate, select and implement storm hardening alternatives. PEF plans to conduct one EWL distribution pilot project on Feeder #X220 in St. Petersburg. The Company will also use

prevention benefit for their distribution poles." Cutliffe Test. at 6. Furthermore, as emphasized at Page 2 of its Plan Supplement, in many areas, the Company's distribution system includes span lengths that are shorter than required for Grade C construction because the facilities are located in urban areas. As such, in many locations, Progress's facilities already have design strengths much greater than 60 mph, and in many instances, even exceed Grade B. (PEF Plan Supplement, JC-2T, at 18) Progress is taking a measured approach to storm hardening, which focuses on practical efforts, such as vegetation management, as the means to prepare for severe storms, and it plans to study whether there may be benefits to Grade B or EWL construction through experimental projects.

The eight small conductor replacement projects which Progress has included in its plan is one of the most fundamental, economical, effective storm hardening initiatives available. When the replacement of these small high voltage wires which are prone to break and fall when hit by limbs in hurricanes or thunder storms is combined with a tree trimming and major maintenance overhaul of aging feeder lines it makes substantial improvements in reliability in all storms. These are exactly the type of "return to basics programs" that should be emphasized along with the solid commitment to bring Florida's tree trimming and wood pole inspections up to national standards. The eight year cycle is the National Rural Electrical Cooperatives standard for wood pole inspections for Florida. The three year cycle is the national recommended tree trimming cycle for distribution lines. The NESC Grade C in the basic national standard for distribution lines.

Progress's approach should result in minimal incremental costs while still ensuring improvement in storm performance and storm restoration. Progress estimates that it will spend up to $91 million in connection with hardening efforts in 2007, $98.7 million in 2008, and an additional $99.3 million in 2009, but these costs are targeted towards areas

most likely to provide the most significant storm hardening benefits, i.e. vegetation management, transmission upgrades, and targeted hardening projects along with increased maintenance such as was explained above.

Furthermore, Rule 250C of the 2007 NESC contains the EWL standard and describes the application of the extreme wind loading required in Rule 250A1 on poles and their supported facilities, including wires, transformers, etc. for purposes of determining the required strength of the pole. The current edition of the NESC exempts from the EWL criteria any structure and its supported facilities that are 60 feet or less above ground. As a clarifying point, only Rule 250C specifies when extreme wind loading is required, not Figure 250-2(d), which is the NESC provision referenced in F.A.C. 25-6.0342. Figure 250-2(d) specifies three-second gust wind speeds for Florida, which are then referenced in Rule 250C.

Q. Does the NESC require EWL for poles 60 feet or less in height?

A. No. The question of requiring EWL standards to be applied to all poles also has been carefully considered by the responsible NESC subcommittee. The NESC committee responsible for strengths and loadings of overhead electrical systems has considered on numerous occasions whether to apply EWL criteria to distribution lines less than 60 feet high. In fact, during each of the last two code cycles, the NESC committee considered proposed changes that would have required application of EWL to distribution systems of any height. In comments filed in those proceedings, the utility industry resoundingly agreed that most distribution pole failures in extreme weather events are the result of secondary damage effects from trees and debris, not wind alone, and that the system would have failed even if designed to the significantly more expensive EWL criteria. Based largely on this feedback from the field, the NESC committee retained the EWL exemption for structures 60 feet and less in the 2007 Code.

Q. Have other Florida utilities decided to adopt EWL criteria as part of their storm hardening plans?

A. Only FPL has embraced EWL as a standard of construction. Tampa Electric Company and Gulf Power Company are taking a similar approach to Progress; they are studying EWL criteria on a limited pilot project basis.

Indeed, other expert witnesses filing testimony on behalf of Gulf Power and Progress Energy Florida in support of their storm hardening plans agree that EWL is not the right standard for poles 60 feet and less in height. For example, according to Gulf Power's witness, Edward J. Battaglia, Gulf decided not to adopt the NESC EWL standards for all of its existing overhead distribution facilities because it is not cost effective to do so and stating, "Gulf's experience is that wind-blown debris is the predominant cause of damage versus pure wind." Battaglia Test. at 15. And, Mr. Mickey Gunter, who serves as a member of NESC Subcommittee 4 (Overhead Lines-Clearances,) Subcommittee 7 (Underground lines) and the Interpretations committee, filing testimony on behalf of PEF, stated, "I agree with the 217 others who supported the rejection of eliminating the 60 foot exemption and retaining it in the 2007 NESC edition because eliminating the 60 foot exemption would yield unnecessary costs without significantly improving or increasing safety." Gunter Test. at 7.

Similarly, Dr. Larry Slavin, Chairman of the NESC Subcommittee 5, which is responsible for provisions related to overhead-lines strength and loading, filed testimony on behalf of Verizon in Dockets 060173-EU and 060172-EU in which he opined that the application of EWL to distribution poles is not prudent or cost effective. Slavin Aff. § 3.1. I have attached that testimony as MTH-2. Dr. Slavin also pointed out that the use of EWL criteria may have negative unintended consequences including increasing vehicular injuries and deaths resulting from cars hitting a greater number of heavier poles, more

downed poles in storms, increased storm restoration delay resulting from more pole failures and harder to replace poles, and a steep learning-curve for engineers not yet trained in these types of complex engineering applications. *Id.* § 4.2. Dr. Slavin and I are also of like mind that EWL should be applied to distribution poles, if at all, on a limited "trial" or pilot project basis.

Q. Will building to EWL ensure that poles do not fail in hurricane conditions?

A. No. Based on my experience, the common causes of hurricane related pole failures are falling trees, flying tree limbs and building debris, soft soil made worse by heavy rains, weak guy failure, rotten pole failure, and finally wind force on poles, lines and attachments. Another common cause of wood pole failures is cascading of solid (strong) poles because an adjacent pole breaks in high wind because of flying debris, rot or another defect. These causes will not be remedied by application of EWL criteria. Structures designed to EWL are also prone to cascading failures.

Q. Did the Plan adequately consider using EWL for new construction, major planned work, expansions, rebuilds and relocations of the overhead distribution system?

A. Yes, the Plan considered and rejected applying EWL criteria to new construction, major planned work, expansion, rebuilds and relocations of the overhead distribution system. Instead, Progress states that it will continue to use Grade C criteria in these instances. Specifically, the Plan states that: "PEF's design standards can be summarized as: 1) quality construction in adherence with current NESC requirements, 2) well defined and consistently executed maintenance plans, and 3) prudent end-of-life equipment replacement programs. When these elements are coupled with a sound and practiced emergency response plan, construction grades as defined by the NESC provide the best balance between cost and performance." Plan at 4. In addition, responding to Staff

Interrogatory No. 7, regarding the process by which Progress measured the percentage of storm hardening on a project-by-project basis, Progress references the Asset Investment Strategy (AIS) Model Summary Report, included as Attachment E to its Plan Supplement.

Q. Does the Company's decision not to use EWL criteria for new construction, planned work, expansions, rebuilds and relocations meet the desired objectives of enhancing reliability and reducing restoration costs and outage times in a prudent, practical and cost-effective manner?

A. Yes. Compliance with the applicable grade of construction required by the NESC—which is Grade C or B as applicable for poles 60 feet or less in height—will meet the Commission's objectives as long as other initiatives—such as vegetation management, increased guying, small conductor replacement and replacing rotten poles—are implemented.

Deployment Strategy

Q. Does the Company's Plan adequately describe the Company's deployment strategy, including the facilities affected, the technical design specifications, construction standards and construction methodologies employed, the communities where electric infrastructure improvements are to be made, the extent to which improvements involve joint use facilities, and the costs and benefits of the proposed Plan as required by Rule 25-06.0342(4)?

A. For the most part, yes, the Plan adequately *describes* its deployment strategy. Rule 25-06.0342(4), F.A.C., regarding the deployment strategy is quite specific about the level of detail required in the storm hardening plans. The Rule requires each utility to explain the systematic approach it will follow to achieve the desired objectives. The deployment strategy details that must be included in each storm hardening plan are broken down into subsections (a) thru (e).

The Company's deployment strategy is set forth at pages 9 - 13 of the Company's Plan. Progress's deployment strategy includes retaining Davies Consulting, and the development of a program to assist in prioritizing hardening projects. The model performs a cost-benefit analysis of: overhead to underground conversions; small wire upgrades; back lot to front lot line relocations; submersible UG; and alternative NESC standards, including Grade B and EWL pilot projects.

Q. In what way, if any, is the description of the Company's deployment strategy lacking?

A. First, the Plan does not adequately identify the costs and benefits of its proposed Plan on third party attachers. However, Progress has agreed to a Process to Engage Third Party Attachers pursuant to which it will provide updated information about the specific design and construction specifications it will be employing to third party attachers on an annual basis. This should remedy the current lack of details in the Plan.

Q. Can you provide an assessment of the costs and benefits of the Company's Plan on third party attachers at this time?

A. The Company's Plan does not yet include enough specific information about the costs and benefits of its storm hardening plan to enable me to provide a specific estimate of the costs and benefits that the Company's plan will have on third party attachers. The Company's Plan provides cost estimates for 2007, 2008 and 2009 on a project annual basis. It would be helpful to have more details about these costs including if possible an estimate of the incremental costs per mile and more details about the plant with third party attachments that will be impacted by these costs. The Company provided some additional cost information detail in its responses to discovery requests submitted in this Docket. That information is currently being analyzed but no conclusions have been reached at this time.

I can say that the costs that may be recovered from cable operators are tightly prescribed by the FCC. Under the federal scheme, FCTA members pay both make-ready costs—i.e., the cost of making the pole ready for its attachments (including the cost of rearranging existing facilities on the pole, guying the pole to increase strength, or replacing the pole where necessary) and annual rent pursuant to the FCC's rate formula, which assures that pole owners receive the fully allocated costs of accommodating the attachment. The annual pole attachment rent is determined by multiplying the percentage of the total usable space occupied by the pole attachment by the sum of the operating expenses and actual capital costs of the utility attributable to the entire pole. In addition, depending upon the circumstances, cable operators may incur the cost of transferring their facilities to a new pole.

It is clear that cable operators will incur significant additional costs as a result of the Company's Plan and likely will experience significant delays in provisioning service to customers as a result of the new processes and standards the Company is adopting in connection with storm hardening. These delays likely will result in lost customers.

From the information I have seen thus far I do see a corresponding benefit to third party attachers resulting from some of the storm hardening activities that Progress is planning. I also believe that more detailed information about the specific design and construction criteria that will be used, and the specific joint use poles that will be impacted, will better enable third party attachers to assess the costs and benefits to their operations.

Q. Does the proposed Process to Engage Third Party Attachers alleviate your concerns about the level of detail in Progress's Plan?

A. Yes. The Process to Engage Third Party Attachers that has been agreed to by Progress sets forth a mutually satisfactory process for continuing the dialogue between utilities and

third party attachers, including reasonable advance notice to, and a process for incorporating feedback from, third party attachers. This goes a long way toward alleviating my concerns about the level of required detail that currently is missing from Progress's Plan.

Q. Is the Company's deployment strategy prudent, practical and cost-effective?

A. From the information that is provided by Progress, it appears that Progress's deployment strategy is prudent, practical and cost effective. Progress intends to focus its distribution, efforts on vegetation management, wood pole inspections, small conductor replacement, good maintenance practices and other Storm Preparedness initiatives. These are the fundamentals necessary for distribution reliability and should not be neglected. Progress will use overhead to underground conversions in lieu of EWL on 19 major highway crossings and conduct one EWL pilot project. Progress will also allocate significant funds and resources to building all new and replaced transmission facilities to EWL steel or concrete poles. These are prudent, practical, and cost effective approaches to storm hardening.

Q. Has Progress explained the methodology it will use to assess pole strength for purposes of determining whether a pole should be replaced?

A. Yes.

Q. Do you agree with the methodology being employed by Progress to assess pole strength?

A. For the most part, yes. Progress plans to use PoleForeman pole loading analysis software to perform its comprehensive pole loading analysis. I am concerned that PoleForeman may not take into account all of the relevant criteria for assessing the true strength of the pole and its ability to withstand wind loading. For example, I do not believe that PoleForeman takes into account the guying effect of lateral lines on the pole without special application procedures. Considering that pole loading calculations with computer

software, as opposed to the engineering guidelines, tables and charts that have served very well for electric utility distribution design for decades, is new to Progress and many others, extra caution should be used to be certain that beneficial as well as detrimental loading effects on poles are included in the sophisticated calculations.

Q. Please explain what you mean by the guying effects of lateral lines and other beneficial loading effects of guy wires on poles.

A. Poles or any tower can be designed to be held upright by as few as three guy wires when nothing else is attached. A guy wire is a strong steel wire which is attached to a pole near the height on the pole where the pole needs additional support. The other end of the guy may be attached to a strong steel anchor in the ground or to another pole in the direction that the pull of the guy is needed. The requirements are that the guys and their anchors must have enough strength to overcome the horizontal force of wind on the structure. The structure must have enough strength to withstand the vertical load, if any, of the guys' downward component of pull on the tower. The horizontal component of the pull of the guys is what must equal or exceed the applied force of the wind.

Power lines near the top of the poles create the effect of having two sets of "guys" attached to the poles. These wires are much stronger than the tension at which they are strung from pole to pole. The amount that the strength of each of these wires exceeds the pounds of tension on the wire is available to help strengthen the pole in that direction. This is the same effect on pole strength as guying. The lines are either straight through, turn an angle or stop on each pole. The straight line poles are called tangent structures, the angles are angle structures and the last ones are called dead end poles.

A tangent structure must have enough strength to withstand the force of the assumed speed of the wind for which it is designed. The wind direction must be assumed to be that which results in the most load on the pole. For a tangent pole with no other

wires or guys attached, the worst direction is perpendicular to the line because of the ability (guying effect) of the line to support the pole in two directions as stated above. The wind force is based on the exposed surface area of the structure and all of its attachments. This strength may be provided by the structure alone or other support such as guy wires and other electric wires and cables attached to the pole. These other attachments leave individual poles in various directions and at different heights. All of these attachments must have greater strength than the tension under which they operate. The operating tensions and strength of various wires and cables generally is known and the tension depends on the distance to the next pole. The amount that the strength of any attachment exceeds its operating tension produces a guying effect on the pole.

Angle poles are similar to a tower which is guyed three ways. The line provides guying effects in two directions and the third is provided by a guy and anchor, a horizontal guy wire to another pole or another line leaving the pole and acting as a guy. A dead end pole normally is strengthened in one direction by the power lines and by a guy wire or guy wires in the opposite direction. Dead end poles can be guyed if space is available by two guys whose anchors are spread apart enough to effectively storm guy the pole. The horizontal component of all of these guying effects can and often does make a common diameter pole strong enough to meet EWL or Grade C standards.

Q. Do you have an understanding of how Progress considers these guying effects on poles?

A. No. Progress has discussed this concern with me but it is not yet clear to me how PoleForeman can be utilized to account for the *guying effects* of other lines, cables and guys on poles in the evaluation of the strength of a given pole. If these guying effects are not taken into account, many poles strong enough to meet grade C, or Grade B or even EWL, may be changed out unnecessarily by Progress at great expense. We all have a common interest in resolving this question.

Third Party Attachment Standards And Procedures

Q. Does the Company maintain standards and procedures for attachments by others that meet or exceed the NESC?

A. Yes. Progress's attachment standards and procedures for third party attachments included in its Plan meet or exceed the provisions of the NESC that are relevant to this proceeding which, as I have stated above, are Sections 24 thru 26 relating to strength and loading requirements including the effect of wind on the poles and attachments. *Se,e e.g.,* Plan at 22 and Attachment J.

Q. Do the third party attachment standards and procedures included in the Company's Plan comply with the requirements of Rule 25-6.0342(5), F.A.C.; i.e., do they meet or exceed the edition of the NESC that is applicable, so as to assure, as far as is reasonably practicable that third party attachments do not impair electric service reliability or overload the pole, and are constructed, maintained and operated in accordance with generally accepted engineering practices for the IOU's service territory?

A. No.

Q. Why not?

A. First, Progress includes in its plan submitted to the FPSC for approval certain terms and conditions governing third party attachments that are not related to the Commission's overall objective of enhancing electric reliability or reducing restoration costs i.e., storm hardening. Only standards and procedures that concern the loading impact of third party attachments on the strength of poles relate to storm hardening and should be in the plans. Second, some of the third party attachment standards and procedures do not "assure as far as reasonably practicable that third party attachments do not impair electric safety, adequacy, or pole reliability, do not exceed pole loading capacity, and are constructed, installed, maintained, and operated in accordance with generally accepted engineering

practices for the utility's service territory," and therefore should not be approved. The meaning in the NESC of practicable has always been that something must not only be possible but that it must also be practical as well.

Q. Please explain which terms and conditions governing third party attachments included in Progress's Plan are not related to the overall storm hardening objective?

A. Progress's Joint Use Pole Attachment Guidelines reflect that, if the attacher fails to install identifying tags or, when an attacher's facilities are acquired by another entity, if the acquiring entity fails or refuses to retag its facilities within the one-year time allotted, Progress may deem the attacher in violation. These requirements are extremely stringent and should not be approved in the context of the storm hardening initiative. Progress recently, for purposes of its pole attachment audit, unilaterally modified its definition of "attachment," which has resulted in a significant increase in the number of attachments Progress has deemed "unauthorized." These types of terms and conditions should simply not be included in the Plan. Indeed, these provisions constitute rates, terms and conditions of attachment which are governed by pole attachment agreements between the parties and fall within the jurisdiction of another regulatory body, particularly the FCC, which under statute has exclusive authority to regulate the "rates, terms and conditions for pole attachments to provide that such rates, terms and conditions are just and reasonable" in non-certified states such as Florida.

Q. Which of Progress's attachment standards and procedures address the loading impact of third party attachments on the pole and thus, concern storm hardening?

A. Only those provisions pertaining to the loading effect of third party attachments on the pole are relevant to the concerns raised in this proceeding. The attachment standards relating to cable diameter, weight and installed tension and guying standards as well as identifying the poles affected are relevant. For instance, Progress's attachment standards

and procedures mandate that all new attachments, as well as overlashing, require a permit, and states that permit applications must include the cable or overlashing specifications and the pole(s) on which attachments or overlashing is requested, and must comply with guying standards.

Q. Are all of these attachment standards and procedures that concern storm hardening prudent, practical and cost effective?

A. No. In particular, Progress's requirements for overlashing are not. Progress requires full permitting for overlashing. See Plan Attach. A, Progress Energy Joint Use-Pole Attachment Guidelines & Clearances, PGN Drawing 09.04-01. My understanding is that permitting is regulated by the FCC as a term and condition of attachment, and that the FCC has stated that utilities may not require permits for overlashing. Rule 25-6.0342(8), F.A.C. provides that "Nothing in this rule is intended to conflict with Title 47, United States Code, Section 224, relating to FCC jurisdiction over pole attachments." Moreover, it is not prudent, practical or cost effective to require permitting or a complete loading analysis for overlashing.

Q. Please explain what is meant by "overlashing."

A. What a cable operator initially attaches to the pole (i.e., a "new attachment") is not usually the coaxial or fiber conductor itself, but a steel wire support strand attached to the pole with a clamp and through bolt. The operator then places communications conductors parallel to the strand and secures them by wrapping the strand and the conductor(s) with a thin steel filament called a lashing wire applied by a lashing machine. The cables are not wrapped around the support strand. Through the life of the plant, the cable operator may alter that plant, including by *lashing* additional conductors to the existing strand, i.e., overlashing. For example, growing neighborhoods may be served by lashing additional or rerouted trunk cables to the existing strand, using another filament lashing the new line to

the existing strand. More often, in today's applications, fiber optic sheath is "overlashed" to the coaxial cables in order to increase bandwidth and to provide capacity to offer new services. In addition, operators use overlashing in emergency situations to repair customer outages. Overlashing is used to eliminate amplifiers (which are potential points of failure); to expand channel capacity; and to provide capacity for additional services. Overlashing does not use more pole space, because the same strand remains attached to the same licensed position on the pole. Indeed, it is common for more than one cable to be held in place by lashing it to an already existing and already licensed strand or messenger.

In my experience third party attachments do not significantly increase the load on poles, and overlashing has only a very small incremental effect on the already attached strand and cable assembly. Rather, power lines, hardware for attaching lines to poles and power apparatus such as transformers, fused switches, lightning arrester assemblies, outdoor lights and many other power company attachments usually account for most of the wind load on a pole because they have a larger cross sectional area and are attached to the top part of poles. Wind load is a product of the surface area exposed to the wind multiplied times the force of the assumed wind and also multiplied times the pole height from the fixed point (often the ground line or the lowest guy wire) on the pole. As stated above, today's overlashing typically is of fiber optic sheath—a very light weight material that is quite small in diameter. A common fiber optic cable is .59" diameter and weighs .05 pounds per foot. Thus, overlashing will not in the large majority of cases bring a pole out of compliance.

Q. What do you propose as a prudent, practical and cost effective solution for overlashing?

A. I recommend that cable operators be permitted to overlash existing strand provided that they assess the loading impact on the pole within 30 days of overlashing. To the extent

that the loading analysis demonstrates that the overlashing brings the pole out of compliance (or, as is more likely to be the case when poles are found to be overloaded, that the pole was already out of compliance) the operator should notify the pole owner, and make-ready should be planned.

Q. Is this ever done?

A. Yes, all the time. In fact, other Florida utilities, including TECO, have been doing this in practice for years. Progress only recently, in 2004, instituted any requirements for overlashing. Historically, Gulf Power Company did not perform any loading analysis on the poles caused by overlashing. Tellingly, of the four utilities that filed storm hardening plans on May 7, 2007, not one has pointed to a single instance in which overlashing has caused a pole failure in response to FCTA's interrogatories on the subject.

Q. Is your suggested approach consistent with the NESC?

A. Yes. The NESC is a performance standard. The NESC rules provide for what is to be accomplished. The utilities covered by the NESC, including power and communications companies, all have practicable industry practices and reasonable engineering guidelines available to assure compliance with the rules. An exhaustive engineering loading analysis on every pole is not necessary or practicable every time a communication or power attachment is added or modified on a pole. Indeed, given the delays and expense associated with a full engineering loading analysis for overlashing, and the likelihood that the overlash will not be a factor contributing to any overload, any such requirement would not be cost-effective, prudent or practical.

Q. Is this consistent with generally accepted engineering practices for the utility's service territory?

A. Yes. Several Florida pole owners and pole owners throughout the southeast allow cable operators to overlash existing strand and notify the pole owner after the fact. It is

common practice throughout the industry to allow cable operators to notify pole owners after the fact that they have attached to a "drop" pole—i.e., an oftentimes shorter pole used to carry a few service lines to a residence or business.

.Q. Are you suggesting that overlashing should be permitted to bring a pole out of compliance?

A. No. First, it is highly unlikely that the incremental wind load caused by overlashing will bring the pole out of compliance. The strand-supported coaxial cable that typically comprises the initial attachment, is itself one of the attachments that contributes the least to the wind loading of the pole. The wind load is determined by the diameter and length of wires and cables attached to poles as well as the diameter of the pole and the area of equipment on the pole. The area of each attachment is multiplied times the wind force and its attachment height. The wind load, expressed in foot pounds, causes a mechanical "moment" on the pole at the ground line. The final step in the calculation is to multiply the wind load on each attachment times the height of the attachment above ground i.e., the moment arm.

Coaxial cables, used by cable television companies, are smaller and lighter than the common multi-conductor copper communications cables used by telecommunications carriers. Moreover, initial attachment of strand-supported cable plant is handled through the application and make-ready process where the pole strength is evaluated and determined to be adequate. Even lighter than coaxial cables, however, are the fiber optic conductors which are most commonly used for cable television construction today. Indeed, .59-inch fiber optic conductors weigh only 50 pounds per 1000 feet.

In contrast, there are typically three power wires attached to the top of poles (primary voltage wires) with the neutral and secondary wires a few feet below the primaries but at least 40 inches above the highest communication cable. These wires

frequently weigh more than coaxial cable. Power equipment mounted on poles above communications cables also adds wind load as well as the surface area of the pole itself. All of the power lines and equipment wind loads have to be multiplied times the longer moment arm determined by their higher attachment points above ground.

For all of these reasons and more, the loading effect of cable plant is often treated as insignificant in utility practice. The loading effect of overlashing is even less significant. In my experience, I have found no instance in which overlashed fiber was the "straw that broke the camel's back" by pushing an otherwise compliant pole into violation of applicable loading criteria.

Second, any slight non-compliance that might possibly be caused by overlashing could be quickly remedied. Attachers would be required to notify the pole owner within 30 days of overlashing and/or would assess the loading on the poles themselves.

Q. Do you think that even overlashing resulting in significantly increased size bundles should be allowed without prior notice?

A. At a minimum, I think there should be some incremental load for overlashing that does not require a full blown loading analysis. For incremental loads that exceed an agreed upon threshold, I believe that a loading analysis can be performed by the attaching entity with the results provided to the pole owner.

Q. What is the standard adopted by New York?

A. The rule adopted by the New York PSC provides that "a predetermined limited amount of overlashing, that is not a substantial increase to existing facilities, shall be allowed," without notification and allows the attacher itself to make the determination. Specifically, "[a]n Attacher, [sic] whose facility has a pre-existing NESC calculated span tension of no more than 1,750 lbs., shall be allowed to overlash a pre-determined maximum load of not more than 20% to the existing communications facility. Existing

facilities with an NESC calculated span tension of less than 1,000 lbs. shall be allowed a pre-determined overlash of up to 40% of such pre-existing facilities." *Proceeding on Motion of the Commission Concerning Certain Pole Attachment Issues*, Order Adopting Policy Statement on Pole Attachment, 2004 N.Y.P.U.C. LEXIS 306, *30 (N.Y.P.U.C. rel. Aug. 6, 2004). If the attacher "determines that the addition of equipment and loading is greater than the pre-determined limits, further assessment of the overlashed facility for its impact on the overall pole loading is required to assure that the pole limits are not exceeded." *Id.* In those cases, the attacher would be required to "provide the pole Owner with a 'worst case' pole analysis from the area to be overlashed, to be sure that the additional facilities will not excessively burden the pole structures." *Id.*

Q. In your experience does the relative placement of cable operators' strand and overlash in the communications space on the poles have any beneficial effect on the stability of the pole or ability to withstand wind and other forces?

A. Yes it can.

Q. Would you please explain?

A. Cable plant is deployed similar to power and telephone plant on pole lines. However, due to the needs of each utility the cable television lines often turn or "pull off" the power pole at locations where the power lines do not turn. This pull off must be guyed unless it pulls off in two opposite directions as at some street crossings. These pull off cable lines with their steel messenger wires provide guying effects on the affected poles which strengthen the pole substantially because the pole is supported at 18 to 22 feet high. It is the same effect as storm guying. This helps keep the poles in a run stable and minimizes cascading as the strand helps keep the lateral poles from pulling down adjacent poles, thus keeping the circuits intact and causing fewer outages, unless of course there is a tree collapse, in which event it is likely no design feature could keep the facilities from being damaged.

Third Party Input

Q. In establishing its Plan did the Company seek input from and attempt in good faith to accommodate concerns raised by third party attachers?

A. Yes, to an extent. The Company did seek input from third party attachers. It conducted meetings with attachers early in the process to receive comments and concerns from attachers. Thereafter, the Company submitted its Plan to the attaching parties and asked for feedback. However, because of the limited information provided by the company in the Plan concerning the projects for 2008 and 2009, the incremental costs associated with storm hardening, and the joint use poles that would be impacted, third party attachers were unable to identify all of their concerns or to provide a cost/benefit assessment of the Plans on third party attachments.

The cable operators did provide specific feedback concerning the Company's attachment standards and procedures for third party attachments, and Progress did make some small changes based on this feedback. While the level of input that third party attachers have been able to provide to date does not completely meet the requirements of the rule, and Progress and FCTA have not resolved all issues there is reasonable expectations that the issues can be resolved. Indeed, the Process to Engage Third Party Attachers that has been agreed to by Progress sets forth a mutually satisfactory process for continuing the dialogue between utilities and third party attachers, including reasonable advance notice to, and a process for incorporating feedback from, third party attachers. This goes a long way toward alleviating my concerns about the level of required detail that currently is missing from Progress's Plan.

Q. Does that conclude your testimony?

A. Yes.

CURRICULUM VITAE
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Registered Professional Engineer (Electrical) GA#10724 (1976)
Registered Professional Engineer (Electrical) FL #51788 (1997)

EDUCATION: B.S. Industrial Engineering (Co-op) GA TECH, 1970

WORK EXPERIENCE:

1959-	Worked part-time with Harrelson Electric Co., owned by my father.
1963	W. T. Harrelson, doing residential, commercial, & industrial electrical and repair work in McRae, GA.
Dec. 1963- Mar. 1970	Co-op student of Georgia Power Co. in Electric Distribution Operating, McRae, GA, & Commercial Sales, North Atlanta.
Apr. 1970- Jan. 1972	Lieutenant in U. S. Army Air Defense, Minneapolis, MINN, & Yong Son, KOREA. Served as Battery Commander, Korea. Military Status: Inactive, Army Reserves; Rank: Captain.
Feb. 1972- June 1974	Operating Engineer, Brunswick, Georgia Power Co.; Designing, operating, and maintaining distribution system and operating transmission system.
June 1974- Feb. 1976	Senior Commercial Marketing Engineer, Brunswick. Selling wise use of electricity to new and existing commercial customers in Brunswick area. This included lighting design to I.E.S. standards, and consultations regarding the National Electrical Code.
Feb. 1976- June 1978	Operating Engineer, St. Simons Island, Ga. Power; Designing, operating, & maintaining distribution system & operating transmission system.
June 1978- May 1986	District Engineer; Supervised engineering and operation of Brunswick District of Ga. Power Co., including Kingsland Operating Headquarters.

May 1986- Sept. 1989 — Area Manager, McRae, Ga. Power Co; Restructure McRae, Eastman, Hazlehurst into area operation, and supervise and coordinate all company activities in the area.

Sept. 1989- April 1992 — District Power Delivery Manager, Milledgeville District; Manager of Engineering, Construction, & Maintenance of the electric distribution system and operation of the transmission & distribution system.

Note: During 28 years with Georgia Power Company, I was involved with claims, damage and accident investigations. From 1978 through 1992, I was in charge of these activities at my location.

April 1,1992 — Resigned from Georgia Power Company, Reason for leaving: Early retirement incentive package gave excellent opportunity to pursue independent consulting engineer goals.

April 1,1992 to present — Electric Utility Consulting Engineer.
Investigated accidents and testified in matters involving the National Electrical Safety Code, OSHA regulations, utility company safety manuals, employee training courses, accepted good work practices, and the National Electrical Code. These cases have involved electrical contact, flash, and burn injuries, collisions with poles and guy wires, falls from poles, etc., hydraulic oil fires, crushing injuries, property losses from fires, stray voltage, etc. The companies involved have been electric, telephone, cable TV, and product manufacturing companies.

I do management consulting and safety and engineering training for electric cooperatives, engineering consulting companies and private industry

I do electric power line inspections for electric cooperatives as required by the Rural Utility Service.

I inspect power lines and communications lines built jointly for National Electrical Safety Code compliance. I teach N.E.S.C. compliance and train field engineers and technicians in joint use compliance. I assist CATV, Power, and Telephone companies in interpreting the NESC and applying its rules to joint use of utility poles.

OTHER COURSES AND SEMINARS:

1974 — 13 weeks Commercial Sales Training by Ga. Power Co., including interior & exterior lighting design, & National Electrical Code.

1975 — 1 week General Electric Outdoor Lighting School, Hendersonville, NC.

1976 — 8 weeks Electric Operations Training by Ga. Power Co.

1977	1 week Principles of Leadership Training, Ga. Power Co.
1979	1 week Basic Management Training by Ga. Power Co.
1980-1985	Served as "Leader" of Engineering Dept Quality Circle.
1981	1 week Communications-General Training by Ga. Power Co.
1982	1 week Human Relations Skills Training by Ga. Power Co.
1987	3 days Interpersonal Skills Seminar by Ga. Power Co.
1988	1 week Management Grid School, Mobile, AL, Training by Southern Co.
1988	13 weeks Community Leadership Class sponsored by University of GA Cooperative Extension Service and Telfair County.
1989	1 week Negotiating Edge Seminar, Athens, GA., Training by Ga. Power Co. and Susan Wise
1989	Basic Economic Development Course, GA Institute of Technology
1990	3 months- Committee assignment (met bi-weekly) to formulate Ga. Power Company Guarantee Policy
1991	6 months-Committee assignment (met bi-weekly) to develop "District Operations Performance Measurement" facilitated by Ernst & Young Co.
1991	3 months-Committee assignment (met bi-weekly) to assess Georgia Power Company Marketing Dept Readiness for Incentive pay.
1992	1 week advanced Negotiating Skills Seminar, Peachtree City, Training by Ga. Power Co. & The Executive Speaker, Inc.
1992	1 day IEEE Seminar on 1993 National Electrical Safety Code
1993	2 day NRECA Safety Accreditation Team Training & Testing Seminar
1994	3 day Seminar-The Development & Application of the National Electrical Safety Code by Allen Clapp
1995	2 day ILCI (International Loss Control Institute, Inc.) Seminar on accident investigation
1996	1 day IEEE Seminar - "Changes in me 1997 NESC."
1997	3 day Seminar - "Application of 1997 NESC."

MEMBERSHIPS AND AFFILIATIONS:

1970-present	Member, Georgia Tech Alumni Association
1974-present	Member, Georgia & National Society of Professional Engineers
1978-1986	Member, Glynn County GA Electrical Inspection Board
1992-present	Member, Telfair Co. Chamber of Commerce
1992-present	Member, Institute of Electrical & Electronics Engineers (IEEE)
1993-2002	Board Member, Telfair County Industrial Development Authority

1993-2002	Member, Illuminating Engineering Society of North America (IECNA)
1993-present	Rural Electric Safety Accreditation Program (RESAP) certified accreditation inspector
1994-present	Member, National Fire Protection Association

TESTIMONY BY MICHAEL T. HARRELSON, P. E.

1. 5-2006 to 8-2007 **Florida Public Service Commission for FCTA**
Michael Gross Attorney — Written comments and
Maria Browne, Attorney — verbal comments
Beth Keating, Attorney

2. 4-27-06 & 5-1-06 **FCTA, et. al vs. Gulf Power Company Before the FCC**
Testimony

John Seiver
Cole, Raywid & Braverman, L.L.P.
1919 Pennsylvania AVE, NW – Suite 200
Washington, D.C. 20006

3. 3-31-06 **FCTA, et. al vs. Gulf Power Company Before the FCC** — Written Testimony

John Seiver
Cole, Raywid & Braverman, L.L.P.
1919 Pennsylvania AVE, NW – Suite 200
Washington, D.C. 20006

4. 3-16-06 & 3-21-06 **FCTA, et. al vs. Gulf Power Company Before the FCC** — Deposition Testimony

John Seiver
Cole, Raywid & Braverman, L.L.P.
1919 Pennsylvania AVE, NW – Suite 200
Washington, D.C. 20006

5. 3-13-06 **Comcast of Arkansas v. Entergy Arkansas Before the FCC** — Deposition Testimony

John D. Thomas
Hogan & Hartson LLP
555 Thirteenth ST, NW

Washington, D.C. 20004

6. 4-16-05 **Louisiana Public Service Commission** Written Testimony

For LCTA

John D. Thomas
Cole, Raywid & Braverman, L.L.P.
1919 Pennsylvania Ave., NW - Suite 200
Washington, D.C. 34358

7. 2-15-05 **CTA Arkansas vs. Entergy** FCC Written Testimony

John D. Thomas -- *for Plaintiff*
Cole, Raywid & Braverman, L.L.P.
1919 Pennsylvania Ave., NW - Suite 200
Washington, D.C. 34358

8. 1-10-05 **Clinton vs. Florida Keys Electrical Cooperative, Inc.** Deposition & Trial

Sixteenth Judicial Circuit Court in and for Monroe Co., Florida

Eric Peterson -- *For Defendant*
Peterson Benard
P. O. Drawer 15700
700West Palm Beach, FL 33416

H. Clay Roberts -- Plaintiff
Proenza, Roberts, Hurst, P.A.
2900 W 28th Terrace, Suite
Miami, Florida 33133

9. 12-03-04 **MEAG vs. Goodman** Testified at Hearing

Mr. Robert Wilmot -- *For Plaintiff*
P. O. Draw 1287
Tifton, GA 31793

MEAG Power Company right-of-way encroachment suit to clear transmission line

right-of-way of mobile homes.

10. 10-22-04 **Caldwell vs. Howard Industries, No. 4:03-cv-198-3** Deposition

United States District Court, Middle District of Georgia, Columbus Division

Lester Tate -- *For Plaintiff*
Akin & Tate
P. O. Box 878
Cartersville, GA 30120

William T. Mitchell, Defense
Cruser & Mitchell, LLP
3500 Parkway Lane
Norcross, GA 30092

11. 6-23-04 Comcast Cable vs. Pacificorp
Deposition

Angela W. Adams -- *For Claimant*
Ballard Spahr Andrews & Ingersoll, LLP
One Utah Center, Suite 600
201 Main Street
Salt Lake City, Utah 84111-2221

12. 6-8-04 Saffold vs. Aldrich Rent-All
Deposition

Heather B. Bush -- *For Defendant*
Peterson Bernard
1550 Southern Boulevard, Suite 300
West Palm Beach, Florida 33416

13. 9-04-03 Perkins v. Georgia Power Company and Altec
Deposition

Attorneys Langston Bass and Hugh McNatt
Defendant
State Court Candler Co., GA

Contractor Lineman contacted 27,000 volts hand-to-band. He was not wearing rubber gloves. He lost both arms. He sued Altec for inadequate bucket truck design and GA Power for inadequate planning and supervising of work. *Settled out of Court.*

14. 5-02-03 McKeown v. CHELCO, et al Deposition & Trial

Attorney Alan E. Horkey -- *For Defendant*
700 S Palofex Street, Suite 170
Pensacola, Florida 32501
Circuit Court, Walton Co., FL

A teen-aged boy hit power pole with pick-up truck in rain on a curve. He had a severe head injury. He sued electric co-op, claimed they should have moved the pole since it had been hit twice before. Pole location complied with code and DOT guidelines. *Jury verdict gave court cost only to plaintiff.*

15. 11-09-01 Duffie vs. Clay Electric Co-op & Cox Cable et al Deposition & Arbitration

Attorney Craig Cooley -- *For Defendant*
200 East Robinson Street, Suite 555
Orlando, Florida 32801
Circuit Court Alachua Co., FL

A motorcycle rider hit a power line which fell across a U. S. Highway. A contributing factor was that a Cox Cable anchor had been improperly installed. This allowed a Clay

Electric Co-op pole to break in four pieces. *Settled at arbitration by Clay, Cox and two Cox sub-contractors.*

16. 12-13-00 Darley vs. Amusements of America, Inc.
Deposition

Attorney Robert R. Gunn -- *For Defendant*
P. O. Box 1606
Macon, GA 31202
State Court, Bibb County, GA

A young man got electric shock when he took hold of a metal rail on the platform of an amusement ride. *Settled*

17. 11-21-00 Causey vs. Okefenoke REMC
Deposition

Attorney Mark Barber -- *For Defendant*
136 N Fairground Street, Suite 100
Marietta, GA 30060
Superior Court, Brantley Co., GA

An onlooker was killed by burning transformer oil. He was watching a lineman attempt to stop an oil leak when the explosion and fire occurred. *Settled*

18. 10-18-00 Malin vs. McElmurray & Oellerich Electrical Service Deposition & Trial

Attorney David Bell -- *For Plaintiff*
P.O. Box 1011
Augusta, GA 30903
Superior Court, Richmond Co., GA

A young man was killed while cleaning pipes in a milking barn when he touched a light fixture which was not grounded. *Jury verdict for $1,000.000.00*

19. 10-04-00 Moses vs. Bill's Dollar Store, et al Deposition & Trial

Attorney David Bell -- *For Plaintiff*
P.O. Box 1011
Augusta, GA 30903
State Court, Gwinnett Co., GA

A gas company employee was killed when he touched a metal rack which held an air conditioning unit. The unit was not grounded. *Settled*

20. 1-25-00 Byrd vs. Glades Electric Co-op
Deposition

Attorney Robert Swartz -- *For Defendant*

Ft. Lauderdale, Florida
Circuit Court, Glades Co., FL

A flatbed truck crane operator was killed when he put the steel cable into a 7200-volt line. He jumped clear of the truck, then attempted to get in the cab and was electrocuted. *Settled.*

21. 9-10-99 Scruggs vs. Georgia Power Company
Deposition

Attorney Rowland Dye -- *For Defendant*
P. O. Box 2426
Augusta, GA 30903
State Court, Georgia

A truck hit a low power line service which had been previously hit by an over-height load of hay. *Settled.*

22. 3-12-97 Price vs. City of Thomasville Deposition & Trial

Attorney Hugh McNatt -- *For Defendant*
Vidalia, GA
Federal Court, Albany, GA

A contractor lineman was badly burned and electric shocked when he lost control of a large wire and violated several other safe-work practices. *Settled.*

23. 12-06-96 Dennard vs. Altec
Deposition

Attorney Lester Tate -- *For Plaintiff*
P. O. Box 878
Cartersville, GA 30120

A lineman's hand was crushed when it was caught between the control lever of his bucket truck and the bottom of a transformer. The control levers were poorly designed. *Settled.*

24. 7-17-96 Raulerson vs. Okefenoke REMC
Deposition

Attorney Richard Rumrell -- *For Defendant*
One Hundred BLDG, Suite 250
Jacksonville, FL 32256
Circuit Court, Duval Co., FL

A laborer was killed when the electric meter pole he was setting contacted a 14,400-:volt power line. Telephone drop wires and cable television were a factor in making the power line lower. *Settled.*

25. 7-02-96 McCoy vs. Coach & Campers of Atlanta
Deposition

Attorney Nikolai Makarenko, Jr, -- *For Defendant*
100 Galleria Parkway, Suite 1510

Atlanta, GA 30309
State Court, Dekalb Co, GA

A customer separated his shoulder when the RV home shocked him. He was on the ladder on back, touched a grounded chain link fence and fell. The electric circuit to the RV was not grounded. *Settled.*

26. 6-07-96 Habeishi vs.Greystone Power Corp. Deposition & Trial

Attorneys Tisinger, Tisinger, Vance & Greer -- *For Defendant*
P.O. Box 2069
Carrollton, GA 30117
Federal Court, Northern District, GA

The electric power was off to a traffic signal because an electrical connection failed. It had been made improperly by Fulton County Traffic Dept. Two cars collided in the intersection killing both wives of the two drivers. *Jury Verdict $7,000,000.00!*

27. 5-16-96 Crossin vs. Central Illinois Light Co.
Deposition

Attorney Richard Glisson - *For Plaintiff*
837 South Fourth Street
Springfield, Illinois 62705
Circuit Court, Sahgamon Co., Illinois

A lineman was electrically shocked when he disconnected a ground wire at the top of a joint transmission and distribution pole. A transformer was connected to the pole ground. The ground was burned open before it connected to the distribution neutral. *Settled.*

28. 3-16-95 Lockhart vs. TCI Cable & BellSouth Deposition & Trial

Attorney M. Francis Stubbs - *For Plaintiff*
P. O. Box 9
Reidsville, GA 30453
Superior Court, Toombs Co., GA

A young man was killed when he struck a TCI guy wire with his neck while riding a motorcycle. The guy wire was abandoned but not maintained in a safe condition. The young man was violating the law by riding off the roadway. *Jury Verdict Defendant's Verdict.*

29. 9-21-94 Vandevender vs. Klein Tools, Inc. Deposition & Arbitration

Attorney Michael Smith - *For Defendant*
240Third ST
Macon, GA 31201
Federal Court, Middle District, GA

A truck operator was badly shocked and burned when he removed his rubber gloves and touched a bucket truck while a hot 7200-volt line was on the ground nearby. He sued Klein Tool Company claiming the grip used broke the wire allowing it to fall. *Arbitration-Defendant's ruling 2 to I.*

30. 8-24-94 Underwood vs. Georgia Power Company
Deposition

Attorney Rowland Dye — *For Defendant*
P.O. Box 2426
Augusta, GA 30903
State Court, Emanuel Co., GA

A laborer attempted to use a 20-foot re-bar to unclog a grain bin auger. He contacted a 7200-volt. power line with the metal bar and lost one arm and had serious burns. He claimed the line was too close. The line complied with the NESC. *Settled.*

31. 4-20-93 Buckner vs. Colquitt Electric Co-op
Deposition

Attorney John Austin — *For Defendant*
400 Perimeter Center Terrace, Suite 1050
Atlanta, GA 30346
Superior Court, Colquitt Co, GA

A laborer was shocked and fell from a pecan tree. He was using a 20-foot long aluminum pole to knock pecans from the limbs. *Settled.*

32. 8-05-90 Lockett vs. Georgia Power Company Deposition & Trial

Attorney Hugh McNatt — *For Defendant*
Vidalia, GA
Superior Court, Telfair Co., GA

Three laborers were raising an aluminum extension ladder under a 7200-volt power line. One was killed, one shocked, one was not hurt. The power line complied with the NESC. *Jury Verdict paid funeral expenses only.*

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Proposed amendments to rules regarding overhead electric facilities to allow more stringent construction standards than required by National Electric Safety Code	Docket No. 060173-EU
and	
In re: Proposed rules governing placement of new electric distribution facilities underground, and conversion of existing overhead distribution facilities to underground facilities, to address effects of extreme weather events	Docket No. 060172-EU Filed: August 11, 2006

AFFIDAVIT OF DR. LAWRENCE M. SLAVIN

The undersigned, being duly sworn, states as follows:

1. I am currently Principal of Outside Plant Consulting Services, Inc. Previously, I had an extensive career at Lucent (formerly AT&T), Bell Telephone Laboratories and Telcordia Technologies (formerly Bellcore). My career at Bell Laboratories, at which I was selected to be a Distinguished Member of Technical Staff, spanned more than 28 years (1961-1989), primarily in telecommunications product design and development. During the subsequent 12 years (1990-2001), I was a member of Telcordia's research and professional service organizations, and served as Director of the Network Facilities, Components, and Energy Group, responsible for requirements, testing, and analysis of outside plant media, components, and powering for telecommunications applications, as well as related installation and construction guidelines.

2. I received my Ph.D in mechanical engineering from New York University in 1969, my Master of Science in engineering mechanics from New York University in 1963 and my Bachelor of Science in mechanical engineering from The Cooper Union for the Advancement of Science & Art in 1961.

3. I have been an active member of NESC Subcommittee 5 since 1998, including the development of the 2002 edition of the NESC and the recently issued 2007 edition. Subcommittee 5 (Overhead Lines – Strength & Loading) is directly responsible for specifying the storm loads and associated structural strength requirements referenced by the PSC. I am Chair of Working Group 5.7 (Seminars and Presentations; Subcommittee 5), and have served on Working Group 5.2 (Complete Revision of Sections 25 and 26; Subcommittee 5), and on the immediately relevant Working Group 5.8 (Application of Extreme Wind to All Structures; Subcommittee 5). I have also been Chair of Working Group 4.10 (New Ice Loads and Clearances; Subcommittee 4, Overhead Lines – Clearances), and serve on as the Accredited Standards Committee ASC-O5 (responsible for *ANSI O5.1, Wood Poles, Specifications and Dimensions*).

4. As Chair of WG 5.7, I have been responsible for organizing and coordinating the following industry information sessions, as well as providing some of the associated technical presentations:

- ***Panel Session: Structural Reliability-Based Design of Utility Poles and the National Electrical Safety Code*, 2003 IEEE Transmission & Distribution Conference and Exposition, 2003**
- ***Panel Session on National Electrical Safety Code (NESC), 2002 Edition, ANSI C2*, 2001 IEEE Transmission & Distribution Conference and Exposition, 2001**

- ***Panel Session on Proposed Changes to Strength & Loading Requirements for the 2002 Edition of the National Electrical Safety Code (NESC)*, IEEE Power Engineering Society, Towers, Poles & Conductors (TP&C) Subcommittee Meeting, 2000**

I will be chairing a panel session regarding the strength and loading requirements of the 2007 edition of the NESC, and presenting related technical information, at the TP&C Subcommittee Meeting in January 2007.

5. Appendix 1 attached to this Affidavit is a report I have prepared concerning proposed Rule 25-6.034 that is being considered in this proceeding. As I discuss in detail in the report, the proposed rule's requirement that electric utilities be guided by the extreme wind loading standards specified in the 2002 edition of the NESC could result in substantially higher facilities costs and lead to significant unintended consequences. Accordingly, I recommend that this requirement not be included in the proposed rule, or (if this recommendation is not accepted), that certain limitations be adopted.

6. Appendix 2 attached to this Affidavit provides more detailed information concerning my career in the telecommunications and related utility industries, including my activities in relevant professional organizations, such as the Main Committee and several Subcommittees for the NESC.

Further Affiant sayeth naught.

Lawrence M. Slavin

Subscribed and sworn to before me this 10 day of August, 2006.

Notary Public, State of NJ

My commission expires:
May 6, 2009

JENNIFER L. OSORIO
NOTARY PUBLIC OF NEW JERSEY
MY COMMISSION EXPIRES MAY 6, 2009

APPENDIX 1

Report Concerning Proposed Rule 25-6.034 As It Relates to Extreme Wind Loading Requirements

1. Introduction

This note provides comments regarding the proposed Florida Public Service Commission (PSC) Rule 25-6.034 to require that the extreme wind loading of the 2002 edition of the National Electrical Safety Code (NESC) be reflected in the design of electric utility-owned poles, including those with third-party (telecommunications) attachments. In particular, NESC-2002 Figure 250-2(d), part of NESC Rule 250C, is cited as a guide. The stated objective of the PSC is to "enhance reliability and reduce restoration costs and outage times" due to hurricane events, such as recently experienced during Hurricane Wilma. The present comments discuss the NESC rules (2002 edition), as applicable to the State of Florida, recent relevant discussions and decisions within the NESC Committee, and the impact of adopting the Extreme Wind Loads of Rule 250C throughout Florida.

2. NESC-2002

The NESC is an American National Standards Institute (ANSI) standard based upon a consensus of those substantially concerned with its scope and provisions, including the Institute of Electrical and Electronic Engineers (IEEE), which also acts as the Secretariat. Other members of the NESC Committee include organizations representing providers of electric power or communications service, their suppliers, and other affected or interested parties. The NESC includes various provisions for the safeguarding of persons from hazards from the installation, operation, and maintenance of electric supply and communication lines and equipment. The rules contain the basic provisions that are considered necessary for the safety of employees and the public.

In general, adherence to the NESC is voluntary; however, many commissions throughout the United States routinely adopt the latest edition, or specific editions, for application within their jurisdictions. For example, the Florida PSC has adopted the 2002 edition.

Sections 25 and 26 of the NESC provide the required strengths and loadings of utility poles and other structures. Section 25 specifies the type storm loads that Grade B or C utility lines are required to withstand. ("Grades of Construction" are discussed below.) Section 26 specifies the required strengths of the structures, as subject to the storm loadings specified in Section 25. (Most of Section 26 -- *e.g.*, Rule 261 -- applies to Grade B or C construction.) Two types of storms are specified -- (1) Combined Ice and Wind Loading (Rule 250B) and (2) Extreme Wind Loading (Rule 250C).

2.1 Combined Ice and Wind (Rule 250B)

Rule 250B refers to the Loading District map, NESC Figure 250-1, reproduced below. The three loading districts in the United States (Heavy, Medium and Light) specify the amount of radial ice buildup and a concurrent wind pressure. The Heavy and Medium districts in the north and central portions of the United States are subject to ½ and ¼ -

inch radial ice buildup, respectively, on all power and communications wires, cables, and conductors, and a concurrent wind pressure corresponding to 40 m.p.h.. The Light district in the southerly portion of the country, including Florida, is assumed to experience no ice buildup, but a wind pressure corresponding to 60 m.p.h. The latter wind speed, although only 50% greater than that assumed in the rest of the country, corresponds to a wind pressure of more than twice that in the Heavy or Medium districts, due to the strong (non-linear) dependence of the wind force on wind speed.[1] However, the lower pressure in the Heavy or Medium district is applied to a greater "sail area" due to the ice buildup on the wires and conductors. Depending upon the wire or conductor diameters, and the ice buildup levels, the resultant transverse loads in the "Light" district may exceed that in the so-called "Heavy" or "Medium" areas. In addition, the application of Rule 250B requires "overload" factors to be applied to the calculated wind forces to provide a conservative margin of safety when selecting appropriate pole sizes. A factor of 2-to-1 is applied to the common Grade C construction, and a factor of 4-to-1 is applied to Grade B construction, where required.[2] (See Section 2.3.) This procedure results in a fairly robust design that experience has shown to provide reliable, safe service.

PART 2. SAFETY RULES FOR OVERHEAD LINES

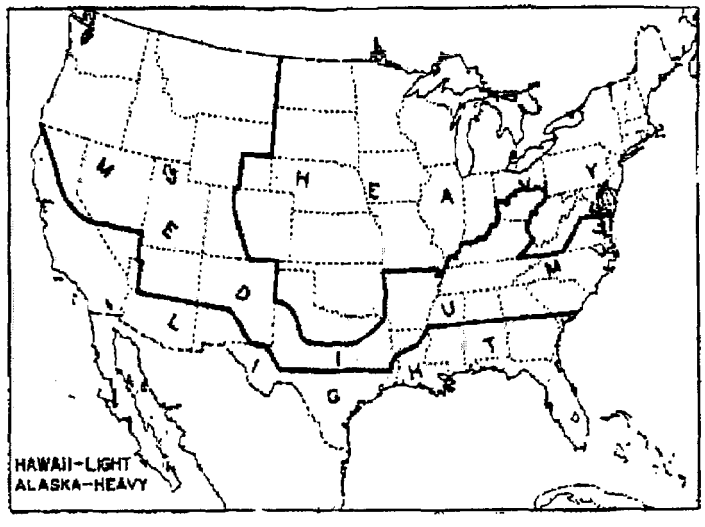

Fig 250-1
General Loading Map of United States
with Respect to Loading of Overhead Lines

[1] The wind pressure, or force, is proportional to the square of the wind speed.
[2] The present discussion assumes "tangent" pole lines, without significant corner angles where guys may be required. For such tangent lines, the transverse wind loads typically represent the critical design condition.

Rule 250B applies to all Grade B or C structures, regardless of height, and is typically used by most utilities to determine the strength requirements for distribution poles.

2.2 Extreme Wind (Rule 250C)

NESC Rule 250C refers to various wind maps, of which Figure 250-2(d), including the state of Florida, is reproduced below. The wind speeds[3] vary from approximately 95 m.p.h. (interpolated) in the north of the state to as much as 150 m.p.h. at the southern tip. The minimum 95 m.p.h. speed corresponds to a wind pressure of 2½ times that of the 60 m.p.h. wind assumed in the Light loading district. The maximum 150 m.p.h. speed corresponds to a wind pressure of more than six times that due to the 60 m.p.h. wind. However, the corresponding overload factors for Rule 250C are lower than that of Rule 250B, somewhat reducing the wide divergence in pole strength requirements. Nonetheless, if applicable, the impact on pole strength and sizes in Florida, and on utility construction practices and costs, would be major, as discussed in detail in Section 4. For various reasons, as discussed in Section 3.1, the NESC only applies Rule 250C to structures exceeding 60 feet in height above ground. This effectively exempts the vast majority of distribution poles. For cases where both Rule 250B and 250C apply, the larger effective loads would determine the required pole strength.

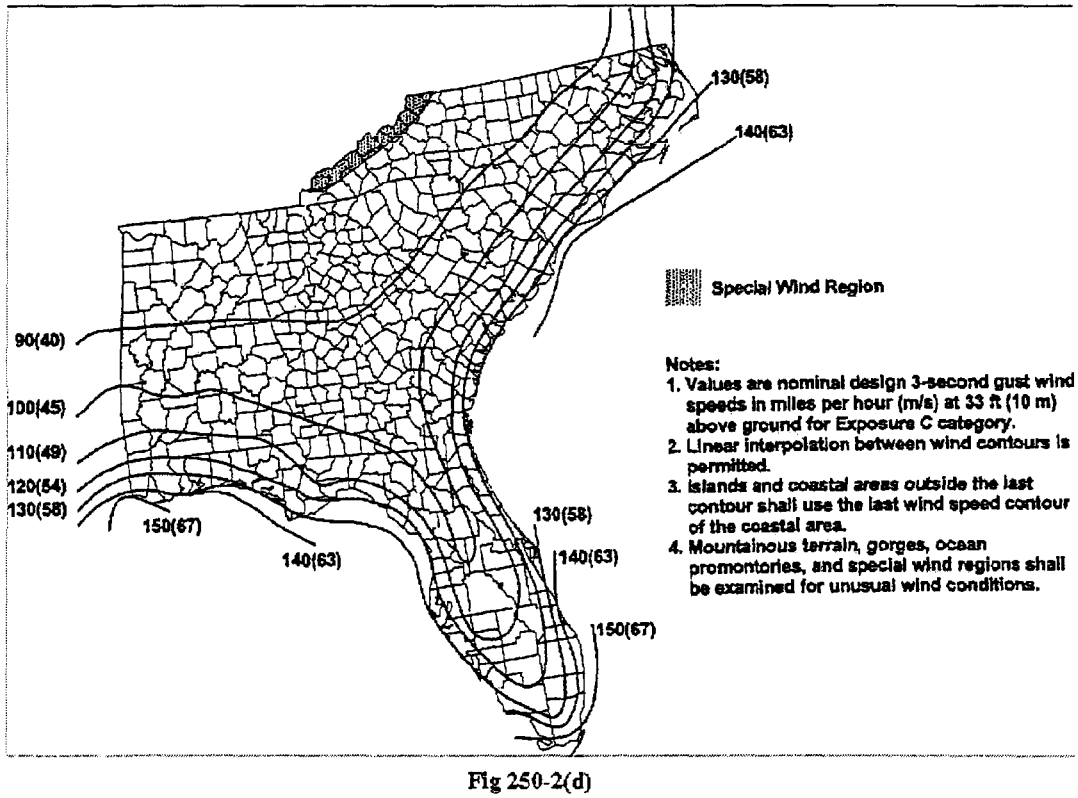

Fig 250-2(d)
Eastern Gulf of Mexico and Southeastern US Hurricane Coastline

[3] Figure 250-2(d) refers to "3-second gust wind speeds", which is approximately 20% greater than the 1-minute average wind speed used as the basis for categorizing hurricane levels by the Saffir-Simpson Hurricane Scale.

2.3 Grades of Construction

Section 24 of the NESC defines three Grades of Construction intended to distinguish between various situations, requiring varying levels of reliability, as implemented by the overload factors described above. In general, these grades depend upon the combination of voltage levels present in the power and communications conductors supported on the same poles, as well as various details, as specified. Most distribution poles carrying "primary power" (> 750 volts) at the upper portion of the pole, and communications cables below, are in the Grade C category. If the adjacent lines cross railroads tracks or limited access highways, a greater reliability level is required, corresponding to Grade B. Most power utility-owned poles are in the Grade C category.

The third grade of construction is Grade N, and applies if the voltages do not exceed 750 volts, corresponding to the lowest level of reliability.[4] This includes joint-usage poles supporting only "secondary power" (< 750 volts) or poles supporting only telecommunications cables.

The NESC does not provide specific storm loading or strength requirements for Grade N structures. NESC Section 25 (Loadings for Grades B and C) is not applicable to Grade N, and Section 26 (Rule 263) only states that "[t]he strength of Grade N construction need not be equal to or greater than Grade C" and that "[p]oles used for lines for which neither Grade B nor C is required shall be of initial size or guyed or braced to withstand expected loads, including line personnel working on them." This lack of specificity for Class N poles allows wide variability in application with respect to selecting appropriate pole strengths to withstand storms.

2.4 Required Strength & Pole Class

Based upon the wind pressures corresponding to the storm loads, as applicable, an appropriate strength pole may be selected. Wood pole sizes and strengths are specified in *ANSI O5.1, Wood Poles, Specifications and Dimensions*. ANSI-O5.1 provides a pole classification system based upon the ability of a pole to withstand lateral loads placed near the top of the pole, in a cantilever situation, such as may correspond to transverse wind loads on a pole with attachments. For example, a popular size Class 4 pole would typically (on the average) withstand a lateral load of 2,400 lbs applied 2 feet from the tip of the pole. A Class 3 pole is stronger, and would withstand 3,000 lbs. Within poles of Class 1 - 10, lower class number poles correspond to stronger (*i.e.*, larger diameter) poles. (Poles of strength greater than Class 1, are classified as H1, H2, and so on) with strength increasing with the H-number.)

Thus, a pole may be described as that supporting a specific "grade" of construction, corresponding to a level of required reliability (Grade B or C), or by a "class" size which is selected to match the strength needed to achieve the required reliability level. The strength is determined and calculated based upon the specified loading details (ice buildup and/or wind speed), the number and size (diameter) of the attachments to the pole, the span length between adjacent poles, and the grade of construction (via the overload factors discussed above).

[4] Grade B applies if the adjacent lines cross railroads tracks or limited access highways.

3. Upcoming and Future Editions of NESC

The 2007 edition of the NESC has recently been issued (August 2006) and is effective as of February 2007. Regarding storm loadings, several significant changes were introduced. Although Rule 250B was left unchanged, a new Rule 250D was added: "Extreme Ice with Concurrent Wind Loading." Similar to Rule 250C, Extreme Wind Loading, Rule 250D would only apply to structures exceeding 60 feet in height, exempting most distribution poles. In any case, this storm load would not have an impact in Florida due to the low associated ice (0-in.) and concurrent wind (30 m.p.h.) loads.

It is particularly interesting that Rule 250C has been modified for the common Grade C construction applications. In previous editions, the overload (design) factors for Grade B and C construction were the same, in spite of the greater implied reliability for the Grade B situations. This inequity was corrected in the 2007 edition by a *reduction* of as much as 25% in the effective design loads for Grade C construction. Thus, in contrast to possibly extending the Extreme Wind Loading to a larger category of structures and applications (*e.g.*, poles ≤ 60 feet height) the NESC requirements, where applicable, have been reduced. Nonetheless, there had been extensive effort and discussions regarding the possible extension of Rule 250C to structures of all heights, as described below.

3.1 Extreme Wind Loading -- Discussions

There is a seemingly eternal debate within the NESC Committee to consider eliminating the 60-foot exemption -- so that poles of all heights would then be subject to extreme wind loading. Such a revision was discussed within the NESC Committee with regard to the 2007 edition but, once again, was rejected. In fact, as described above, where applicable -- *i.e.*, poles taller than 60 feet -- the design requirement for Extreme Wind was actually reduced in severity for Grade C construction.

The rationale for rejecting consideration of extreme winds for "distribution" poles (*i.e.*, poles < 60 feet tall) is that the vast majority of industry experiences indicate that almost all damage to such lines is caused by wind-blown debris such as falling branches, and not by the wind forces acting directly on the wires and poles. In that case, little would be gained by attempting to design such poles to withstand the direct hurricane wind forces. The NESC Loading Section (NESC Section 25) does not explicitly use the term "distribution" when referring to these applications, but the 60-foot height threshold was chosen intentionally to exclude the vast majority of such poles. (In contrast, taller structures, such as critical transmission towers, would benefit from such a requirement.) In addition, to the best of my knowledge, the NESC Committee has never discussed extending any of the storm loads of Section 25 of the NESC (*i.e.*, Combined Ice and Wind or Extreme Wind) to Grade N applications, including telecommunications-only poles or joint-use poles with only secondary power (< 750 volts). Thus, the proposal of the PSC to extend Rule 250C to all distribution poles, regardless of height or grade of construction, would appear to be a major departure from present considerations in the NESC Committee, or industry in general. Thus, it would not appear to be "reasonably practical, feasible, and cost-effective" (to quote from proposed Rule 25-6.034(5)) to attempt to apply Rule 250C to Grade N joint-use distribution poles.

Related discussions within the NESC Committee to extend the Extreme Wind loading to structures of all heights (including distribution poles), focused on a particular change proposal, developed within Working Group 5.8, that would limit the impact of such an otherwise potentially dramatic change. In particular, for the Light Loading District portion of the country, which includes Florida, there would be no impact for distribution structures. However, based upon a multitude of industry comments objecting to even this diluted version of an Extreme Wind requirement for distribution poles throughout the country, this proposed change was not incorporated into the 2007 edition. It may be expected that this (rejected) change proposal will serve as a starting point for similar considerations for the 2012 edition of the NESC.

3.2 Future NESC Meetings (2012 Edition)

Although the 2007 edition of NESC is being issued essentially as this report is being written, efforts on the development of the subsequent 2012 edition are already being anticipated by Subcommittee 5. Due to the general interest in the effects of storm loads, such as hurricanes, and the effort required to properly consider the various aspects, Subcommittee 5 typically begins its meetings considerably earlier in the code cycle than most other subcommittees. Thus, initial meetings for development of the 2012 edition probably will begin in 2007. As a precursor, Working Group 5.7 of Subcommittee 5 (chaired by myself) will hold a panel session in January 2007 for the benefit of interested members of the power industry (IEEE Power Engineering Society, TP&C Subcommittee). The panel session will address the changes adopted in the 2007 edition, but will also discuss some of the proposals that were not accepted. The proposed (rejected) changes to Rule 250C, including the proposed extension to distribution structures, will be of particular interest, and will likely generate comments to be considered in the development of the 2012 edition.

4. Impact of Extending Rule 250C

The unlimited application of Rule 250C to all poles would have a major impact on the cost and operations of the utilities and the third party attachers, and would likely significantly affect the system reliability and restoration efforts, as well as public safety -- albeit not necessarily in the manner expected by the PSC.

4.1 System Cost

For electric utility-owned joint-use Grade N, Grade B or Grade C pole applications, the additional pole costs will depend upon the extent to which the proposed Extreme Wind load would exceed "reasonable" (albeit non-mandated) Grade N loads, and the already required Combined Ice and Wind load for Grade B or C applications for poles not exceeding 60 feet in height. Any increased strength requirement leads to stronger (larger diameter) poles, or a correspondingly greater number of poles (resulting in shorter span lengths), both of which would obviously be more expensive.

Figure 1 illustrates the relative pole strength in comparison to that currently required for the common Grade C joint-usage distribution application; *e.g.*, including primary power

(> 750 volts) with telecommunications cables mounted below the power cables.[5] Assuming the pole does not exceed 60 feet in height (65 feet in length[6]), such a pole must be designed to the present Combined Ice and Wind Loading (NESC Rule 250B, Figure 250-1, Tables 250-1, 253-1 and 261-1A). For present purposes, a tangent line (no corner angles) is assumed, for which the design is based upon the ability to withstand the transverse wind loading. For Florida, located in the NESC Light Loading District (Figure 250-1), this corresponds to a wind speed of approximately 60 m.p.h., but with an additional overload/design factor of approximately 2-to-1 for Grade C, and 4-to-1 for Grade B. For Grade N, a 1-to-1 design factor is conveniently ("reasonably") assumed. For the proposed application of Extreme Wind requirements (NESC Rule 250C), the wind-speed for Florida ranges from less than 100 m.p.h. (assumed to be 95 m.p.h.) in north-central area, to as much as 150 m.p.h. at the southern tip.[7]

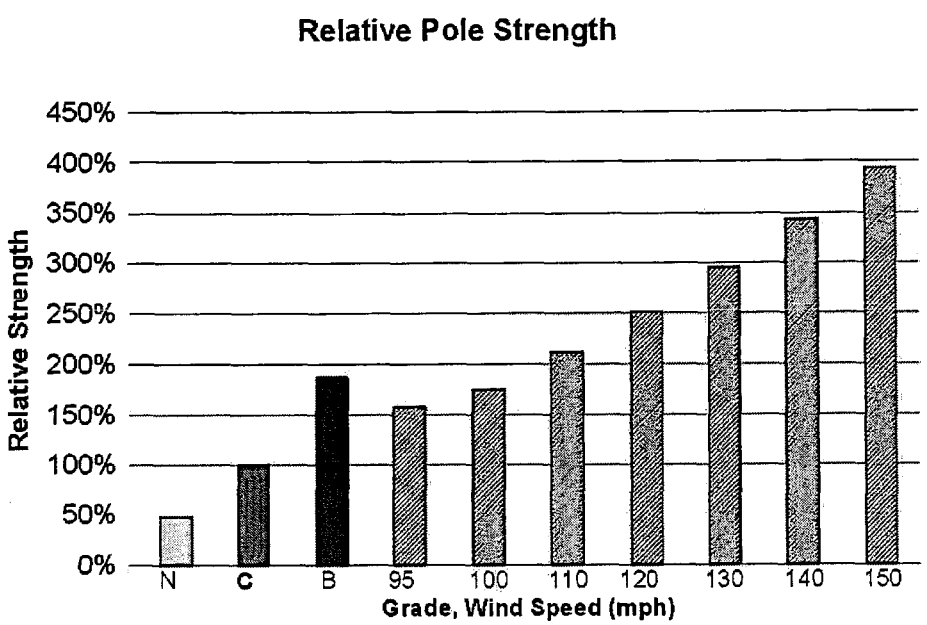

Figure 1
Relative Distribution Pole Strength vs. Typical Grade C Strength Requirements (NESC-2002)

The three solid bars to the left side of Figure 1, labeled "N", "C" and "B", depict the relative magnitude of the present required pole strength for a Grade N, Grade C, or

[5] Grade B construction would typically be limited to special situations (such as railroad crossings and limited access highways).
[6] Wood poles are available in 5 foot increments, and are buried at a depth of 10% the length plus 2 feet, with a slightly greater depth for poles shorter than 40 feet; *e.g.*, a 40-foot pole is buried at a depth of 6 feet, resulting in a 32 feet height above ground. (See ANSI-O5.1 wood pole standard.)
[7] A pole length of 40 feet is assumed. This parameter has only a minor effect on the results.

Grade B application. The seven cross-hatched bars to the right depict the relative magnitude of the required pole strength (which under the proposed rule would be the same for Grade N, C and B poles) due to Extreme Wind loads, at the wind speed indicated, should Rule 250C be directly extended to such applications. The results in Figure 1 thus show that the increased loading for an otherwise Grade C pole may be *increased* by a minimum of 50% (95 m.p.h.) or possibly as much as 300% (150 m.p.h.). In other words, the required strength, or number of poles, would be at least 1½ times -- and possibly as much as four times -- that currently required. For a Grade N pole application, the required strength would be at least three times -- and possibly as much as eight times -- a present reasonable design requirement. For the less common Grade B applications, the impact would not be realized for wind speeds less than 110 m.p.h. Nonetheless, significant strength increases would be required for wind speeds exceeding 110 m.p.h., which are characteristic of significant portions of Florida, as shown in Figure 250-2(d).

Figure 2 illustrates the corresponding pole class that would be required, assuming a Class 4 pole is necessary for the reference Grade C application, and the same number of poles (or span length) is maintained. Similar to Figure 1, the three solid bars to the left side of Figure 2 depict the representative pole class for a Grade N, Grade C, or Grade B application. The seven cross-hatched bars to the right depict the required class pole corresponding to the PSC proposed application of the Extreme Wind loads (which would be the same for Grade N, C and B poles). A minimum increase of three class sizes (to Class 1) for Grade C would be required for the minimum 95 m.p.h. wind, and as much as eight class sizes (to Class H5) for the 150 m.p.h. case. A Class 7 pole would otherwise suffice for the Grade N construction. As above, the Grade B applications would be affected to a lesser degree, but the increased size would still be significant for wind speeds above 110 m.p.h.

The increased pole material costs, including shipping and storage, are directly related to the number of poles or pole size (class). For larger, stronger poles, increased installation costs for the heavier poles may also be anticipated. Furthermore, the availability of such larger size (diameter) poles may be an issue.

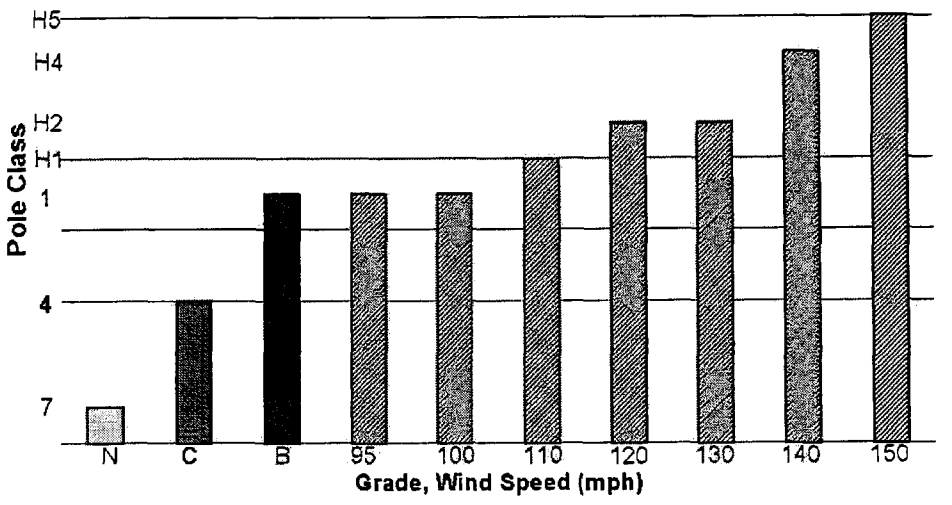

Figure 2
Required Distribution Pole Class vs. Typical Grade C Strength Requirements (NESC-2002)

4.2 Unintended Consequences

The imposition of the Extreme Wind requirement may result in unfortunate "unintended consequences," as sometimes occurs when changing long-standing practices that have generally been deemed successful. For example, as discussed above, the increased pole strength requirement would result in significantly stronger (stouter) poles or a larger number of more conventional size poles, corresponding to shorter spans. Such a practice would have a direct and negative impact on vehicular safety, and conflict with the objectives of the U.S. Department of Transportation, and presumably that of the DOTs of many states. The U.S. DOT is attempting to minimize the number of utility poles in order to reduce the incidence and severity of vehicular accidents. A greater number of poles, or stouter poles, would be contrary to such objectives. Thus, an attempt to modify a national safety code (*i.e.*, the NESC) to accomplish one objective may actually compromise public safety.

Other unintended consequences may also result from the introduction of the proposed Extreme Wind loading, due to a possible significant increase in the number of installed distribution poles along a given route. The June 8, 2006 Florida PSC Memorandum (page 5, Rollins) describes the likelihood that the supposedly less loaded individual poles would nonetheless be damaged in a hurricane, caused by the wind-blown debris and branches, resulting in the much more difficult, and time-consuming, recovery process to repair or reinstall many more poles.

Still another negative consequence relates to the engineering support associated with the implementation of the proposed Extreme Wind loads. The determination of the corresponding wind force is considerably more complicated than that of the existing transverse wind force based upon the present required Combined Ice and Wind loading. While such calculations are generally within the capability of experienced transmission engineers, with civil engineering training, they are beyond that of most distribution engineers. Indeed, one of the change proposals submitted for the 2007 edition was an attempt to simplify the engineering implementation of the Extreme Wind loads for even the applicable transmission applications. Although new or available software packages may alleviate the burden, there will be inevitable confusion and delays -- as well as possible errors in implementation -- in the design and installation of new facilities (including Verizon's fiber-optic networks), to the detriment of the consumers.

5. Recommendations

My primary recommendation is that the Commission not alter the manner in which the NESC's extreme wind loading standards are applied. The NESC is a well-respected document that is generally recognized as having served the industry and public well. For this reason, the NESC Committee (*e.g.*, Subcommittee 5, Strength & Loading) generally attempts to introduce significant changes in a gradual, evolutionary manner, in order to avoid or minimize the potential impact, including unintended negative consequences such as described above (Section 4.2). Thus, previous discussions within the NESC Committee (see Section 3.1 above) to extend the Extreme Wind loading to structures less than 60 feet tall (distribution poles), focused on a particular change proposal, developed within Subcommittee 5, that would limit the impact of such an otherwise potentially dramatic change. In particular, for the Light Loading District portion of the country, which includes Florida, the impact would have been insignificant. Nonetheless, based upon a multitude of industry comments objecting to even this diluted version of an Extreme Wind requirement for distribution poles throughout the country, this proposed change was not incorporated into the 2007 edition of the NESC.

Ideally, the Florida PSC should wait until the next code cycle of the NESC (2012 edition) before encouraging or requiring consideration of the NESC Extreme Wind loading. The related discussions within the NESC Committee during the development process would take into account the experiences during Hurricane Wilma, as well as other recent serious storms. Florida Power & Light, in particular, is well-represented on NESC Subcommittee 5. If the Florida PSC decides to change how the NESC's Extreme Wind loading standards are applied, it should be very cautious in the manner in which such a dramatic, controversial change is introduced. At the least, the Commission should attempt to limit the otherwise dramatic impact to as small a category of facilities as possible, or to reduce the magnitude of the impact. Thus, my alternative recommendation, in the event the Commission moves in this direction, is as follows:

- The proposed PSC rule should limit its scope to Grade B or Grade C applications of electric-only or joint-use poles owned by the electric utilities. Thus, Grade N applications -- which include joint-use poles with only secondary power (< 750

volts), as well as several categories of electric-only poles -- should be explicitly excluded from the proposed application of Rule 250C.

- The application of the NESC Extreme Wind load, as presently specified in NESC-2002, Rule 250C, should be modified to limit the quantitative impact to the affected distribution poles. For example, the reduced loads for Grade C construction incorporated into the latest (2007) edition of the NESC should be explicitly cited as consistent with the intent of PSC Rule 25-6034. For Grade C construction, the corresponding wind forces are reduced by as much as 25% compared to NESC-2002. NESC-2007 is being issued in August 2006, and is effective within six months (February 2007).
- The proposed PSC rule, preferably as modified above, should be applied on a trial basis, initially limited to a specified geographic area and a defined period (*e.g.*, 1-2 years), in order to better understand the potential benefits and consequences of such a rule.

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APPENDIX 2
About Outside Plant Consulting Services, Inc. (OPCS)
(Dr. Lawrence M. Slavin)

Outside Plant Consulting Services, Inc. (OPCS) was established in the year 2002 to help meet the needs of the telecommunications and power industries in establishing standards, guidelines and practices for outside plant facilities and products. The OPCS Group provides related support services for field deployment, and product evaluation and analysis. Dr. Lawrence (Larry) M. Slavin, Principal of OPCS, has extensive experience and expertise in such activities, based upon his many years of service at AT&T/Lucent Bell Telephone Laboratories (Distinguished Member of Technical Staff) in telecommunications product design and development, followed by a career at Telcordia Technologies (Bellcore) in its research and professional service organizations.

As Principal Consultant and Manager/Director of the Network Facilities, Components, and Energy Group at Telcordia, Dr. Slavin was responsible for professional services related to the telecommunications industry. These activities included technical leadership in developing installation and construction practices and "generic requirements" documents, introducing new construction methods, and performing analyses on a wide variety of technologies and products (such as poles, duct, wire and cable, electronic equipment cabinets, flywheel energy storage systems and turbine-generators). Throughout his long career, he has had a leading role in the evolution of many telecommunications related fields and disciplines – including aerial and buried plant design and reliability; advanced construction and cable and duct placement techniques; copper pair, coaxial, and fiber-optic technology; flywheel energy storage systems; physical design and development of hardware and electronic and electro-optic systems (such as the "SLC 96" digital loop carrier); cable media and equipment reliability studies; exploratory fiber-optic hardware development; and systems engineering.

Dr. Slavin is a member of several subcommittees of the National Electrical Safety Code Committee, responsible for specifying safety standards for aerial and buried telecommunications and power facilities in the United States. He is also an active member and participant on the Accredited Standards Committee ASC-O5 ("ANSI-O5") for wood poles and products, as well as on several related committees of the American Society of Civil Engineers. In addition, Dr. Slavin is a Charter Member of the North American Society for Trenchless Technology, has been instrumental in the development of directional drilling standards, and directly supports training activities for the directional drilling industry at the Center for Underground Infrastructure and Research and Education (CUIRE) at Michigan State University. Specific present and recent industry activities are listed below.

Industry Activities

- **National Electrical Safety Code Committee**
  - Represents the national telephone industry, via Alliance for Telecommunications Industry Solutions, ATIS
  - Executive Subcommittee
  - Main Committee
  - Subcommittee 4 (Overhead Lines – Clearances)
  - **Subcommittee 5 (Overhead Lines – Strength & Loading)**
  - Subcommittee 7 (Buried Lines)
- **Accredited Standards Committee ASC-O5**
  - ***ANSI O5.1, Wood Poles, Specifications and Dimensions***
  - *ANSI O5.2, Wood Products, Structural Glued Laminated Timber for Utility Structures*
  - *ANSI O5.3, Wood Products, Solid Sawn-Wood Products and Braces*
- **Pole Reliability Based Design (RBD) Committee, ASCE**
  - ***Reliability-Based Design of Utility Pole Structures***
- **Distribution Pole Standard Committee, ASCE**
- Committee F17 on Plastic Piping Systems, ASTM
  - Subcommittee F17.67 on Trenchless Plastic Pipeline Technology
  - Task Group Leader for development of HDD Standard ASTM F1962
  - *ASTM F1962, Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings*
- Trenchless Installation of Pipelines (TIPS) Committee, ASCE
  - *ASCE Manual of Practice for Pipe Bursting Projects*
- Center for Underground Infrastructure and Research and Education (CUIRE) at Michigan State University
  - Industry Advisory Board
- Trenchless Technology Center, Louisiana Tech University
  - Industry Advisory Board
- North American Society for Trenchless Technology (NASTT)
  - Charter Member
  - Chair of Directional Drilling Subcommittee
- Missouri Western State College
  - HDD Steering Committee

PROCESS TO ENGAGE
THIRD PARTY ATTACHERS

1. The electric utility and third-party attachers will engage in a continuous dialogue on the status of the electric utility's storm hardening plans. A third-party attacher that wishes to be part of this process ("Participant") shall provide notification in writing to the electric utility, providing the name and address of the person designated to receive communications from the electric utility. The electric utility may, no more than once a year, request that Participants confirm that they wish to continue being part of the process and update the name and address of the person designated to receive communication.

2. By September 5 of each year, the electric utility shall provide the Participants with a list of the projects identified in the electric utility's approved storm hardening plan on file with the Commission ("Plan") that the electric utility proposes to undertake in the following calendar year, pending internal budget approval. The electric utility shall provide the Participants with a list of such projects receiving final budget approval promptly as it becomes available.

3. Prior to engineering a job relative to a storm hardening project identified in its Plan, the electric utility shall initiate a meeting with Participants to discuss the electric utility's preliminary ideas for the scope of work ("Pre-Design Meeting"). At the Pre-Design Meeting, the electric utility shall (a)

identify the poles involved; (b) identify whether the electric utility plans to replace poles, change from wood poles to poles of another material (*e.g.*, steel or concrete), place poles in locations different from the existing poles, relocate overhead facilities or underground existing aerial facilities, and; (c) provide the projected commencement date; (d) upon request by a Participant, provide other available information that would enable the Participants to make necessary preparations and evaluate whether to seek dispute resolution pursuant to Rule 25-6.0342(7). During this pre-design phase of a project, the electric utility shall also seek input from Participants as required by Rule 25-6.0342(6).

4. The electric utility shall provide Participants with final engineering plans promptly upon completion. Prior to beginning construction, the electric utility shall initiate a meeting with Participants to discuss coordination of work and a construction schedule.

5. Information submitted to Participants pursuant to section 2, 3 or 4 above regarding projects identified in the electric utility's Plan will not be docketed unless a protest is filed in accordance with Rule 25-6.0342(7), or it is otherwise deemed necessary by the Commission.

6. If the electric utility seeks to amend its Plan by, for example, adding a project not previously identified in its Plan, it shall file a petition with the Commission requesting that the Plan be modified in accordance with Rule 25-6.0342(2).

7. The electric utility will file with the Commission by March 1 each year a status report of its implementation of its Plan. Included in this status report shall be the name of storm hardening projects commenced and/or completed by the electric utility, the routes and circuits affected, and any comments on the project received from third-party attachers.